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ABSTRACT

This booklet is intended to help mainstreamed mentally retarded, emotionally disturbed, or learning disabled high school students acquire a basic understanding of the responsibilities and working conditions of janitors and maintenance persons and to practice basic math skills necessary in the occupation. The first section provides a brief introduction to the occupation by focusing upon those job tasks of a janitor/maintenance person with which the student is likely to be familiar. The next two sections deal with the work environment of the typical janitor/maintenance person and the training, education, and experience needed for the occupation. Exercises addressing basic math skills used by janitors/maintenance persons are provided. Various suggestions are listed for students interested in further exploring the occupation of janitor/maintenance person. A glossary and answer sheet conclude the booklet. (MN)

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MATH on the job

Janitor/Maintenance Person

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MATH ON THE JOB:

JANITOR/MAINTENANCE PERSON

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MATH on the job

Janitor/Maintenance Person

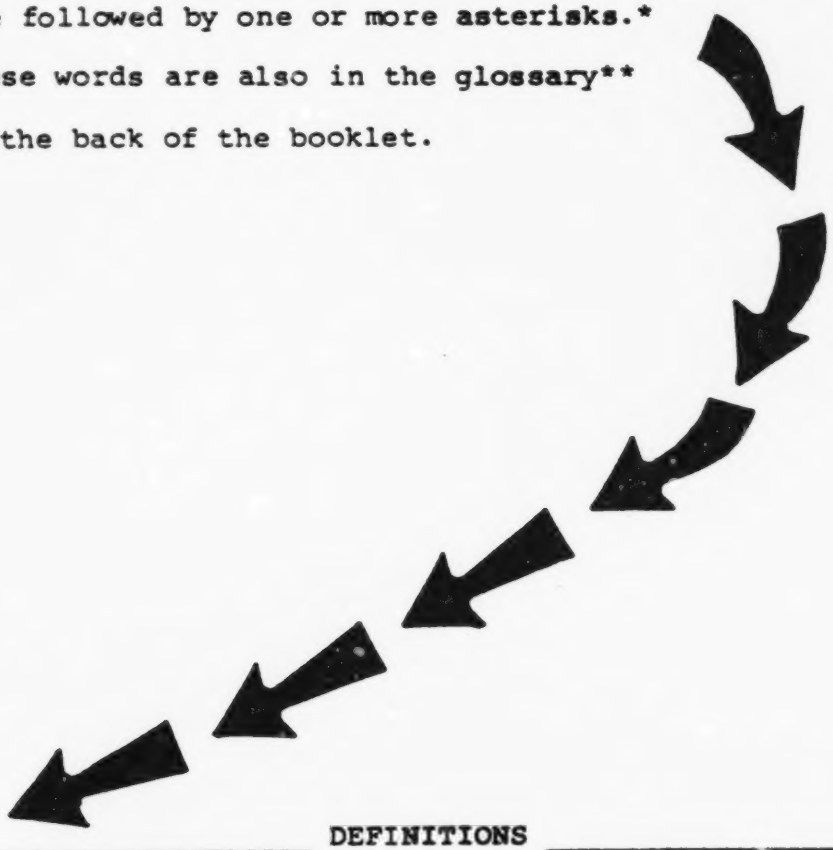
In this booklet, you can--

- find out what a janitor/maintenance person does
- see how a janitor/maintenance person uses math
- get a chance to use math as a janitor/maintenance person
- find out the types of things a janitor/maintenance person needs to know
- find out what courses, training, and experience you need to become a janitor/maintenance person

SPECIAL WORDS USED IN THIS BOOKLET

Workers in many jobs use special words or special meanings for words. Learning these words helps you to learn about a job.

You will find some of these special words in this booklet. When these words, and some hard words, are used for the first time, they are followed by one or more **asterisks.*** These words are also in the **glossary**** at the back of the booklet.



DEFINITIONS

*An asterisk (*) is a symbol that tells you to look at the bottom of the page for the meaning, or definition, of the word.

**A glossary is a list of words with their meanings.

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HAVE YOU EVER...

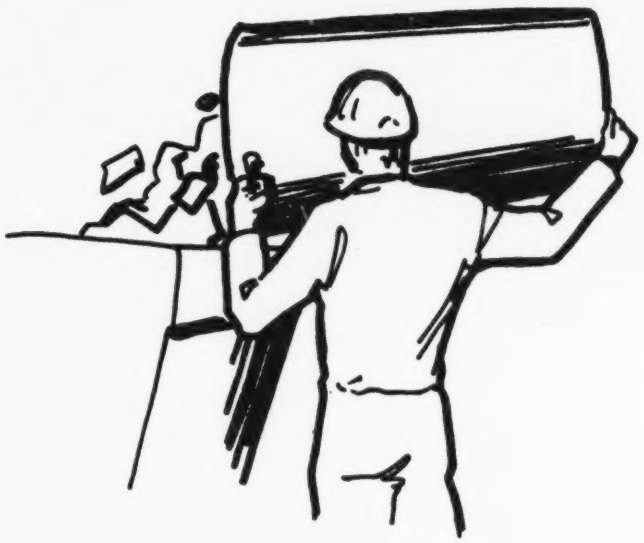
- swept, washed, or waxed floors?
- taken out the trash?
- washed or painted walls?
- replaced a light bulb?
- mowed the lawn?

If you have, then you have some idea about the work of a janitor/maintenance person. This booklet will help you learn about the work of a janitor/maintenance person and how math is important to do the job.

WHAT DOES A JANITOR/MAINTENANCE PERSON DO?

As a janitor/maintenance person, you are responsible for the care and **maintenance*** of many kinds of buildings. You may work in an apartment house, hospital, school, office building, and/or manufacturing plant. You will--

- clean offices and hallways
- maintain furnaces
- tend to plumbing facilities
- remove garbage
- repair minor damages



DEFINITION

*__Maintenance__ is the upkeep and care of property and equipment.

Janitors/maintenance people use math in their work every day. As a janitor/maintenance person, you--

- count, add, subtract, multiply, and divide
- use whole numbers and decimals
- **estimate*** and count supplies
- read and adjust a thermostat that controls room temperature
- estimate and measure distance
- read and follow directions printed on cleaning products

DEFINITION

*To **estimate** is to carefully guess the number or amount of something.

A janitor/maintenance person uses math to mix cleaning solutions.

EXAMPLE

Many cleaning products that a janitor/maintenance person uses must be mixed with water. The directions on the products will tell you how to mix the solution.

Assume that the cleaning product directions say to mix 1 part cleaning solution to 3 parts water. If you use 3 cups cleaning solution, how many cups of water should you use? To figure out the answer, multiply the number of parts of the cleaning product times the parts of water.

$$3 \times 3 = 9$$

You should use 9 cups of water.

NOW YOU TRY IT

Practice Exercise A

Copy and complete the table below.

	Directions	Cups of Cleaning Product Used	Cups of Water Needed
1.	1 part cleaning solution to 2 parts water	3	?
2.	1 part cleaning solution to 4 parts water	6	?
3.	1 part cleaning solution to 2 parts water	8 1/2	?
4.	1 part cleaning solution to 5 parts water	6	?
5.	1 part cleaning solution to 3 parts water	9	?

A janitor/maintenance person uses math to figure out how long a cleaning product will last.

EXAMPLE

A janitor/maintenance person needs to know how long a product will last. Let's assume you have a bottle of floor wax. The directions on the bottle say that 1 ounce will cover 150 square feet. The bottle contains 32 ounces. How many square feet will the bottle of wax cover?

To figure out the answer, multiply the number of ounces in the bottle by the number of square feet one ounce will cover.

32 x 150 = 4,800 square feet

The bottle of wax will cover 4,800 square feet.

NOW YOU TRY IT

Practice Exercise B

How many square feet will each bottle of wax cover?

	Ounces in Bottle	Square Feet 1 Ounce Covers	Total Number of Square Feet
6.	64	22	?
7.	16	112	?
8.	32	96	?
9.	48	55.3	?
10.	24	61.7	?

A janitor/maintenance person uses math to maintain an inventory.

EXAMPLE

A janitor/maintenance person must make sure that the necessary supplies and materials are on hand. Sometimes, it can take several weeks to get a product from the manufacturer.

Let's assume that you are the janitor for a large office building. During the average week, you put a total of 175 paper towel rolls in the bathrooms. Your supervisor has instructed you to keep a 6 week supply on hand. How many rolls of paper towels should you have in your inventory? Multiply the number of rolls used in a week by the number of weeks.

175 x 6 = 1,050 rolls

You should keep 1,050 rolls on hand.

NOW YOU TRY IT

Practice Exercise C

Copy and complete the chart below.

	Amount Used in 1 Week	Number of Weeks Supply	Total Amount in Inventory
11.	64	4	?
12.	?	8	72
13.	11	?	88
14.	90	5	?
15.	42	?	126

A janitor/maintenance person uses math to plan the work day.

EXAMPLE

Let's assume that you are a janitor at a large office building. You have been assigned 30 offices to clean in 6 hours. How many minutes can you spend cleaning each office?

Step 1. Convert hours to minutes by multiplying the number of hours by the number of minutes in an hour.

$$6 \times 60 = 360 \text{ minutes}$$

Step 2. Divide the total number of minutes by the number of offices.

$$360 \div 30 = 12 \text{ minutes}$$

You can spend 12 minutes cleaning each office.

NOW YOU TRY IT

Practice Exercise D

How many minutes can you spend cleaning each office?

	Number of Offices to Clean	Number of Hours	Number of Minutes in Each Office
16.	20	8	?
17.	32	4	?
18.	22	5-1/2	?
19.	30	7	?
20.	20	3-1/2	?

WHERE DOES A JANITOR/MAINTENANCE PERSON WORK?

Your duties as a janitor/maintenance person will depend on where you work. You may work in such places as a--

- school
- hospital
- store
- hotel
- motel
- office building
- apartment building
- industrial plant

You may be hired to work in only one place. Or you may work in more than one kind of facility regularly.

As a janitor/maintenance person, you may be required to work both indoors and outdoors. Indoors, you will perform such tasks as--

- repairing electrical switches
- replacing light bulbs that have burned out
- fixing minor problems with faucets, toilets, and pipes
- repairing wall plaster and woodwork
- notifying a manager or owner of major problems or repair needs

Outdoors, you will perform such tasks as--

- mowing lawns and trimming shrubbery
- raking leaves
- removing snow from porches, sidewalks, driveways, and parking lots
- painting and making repairs on the outside of a building

A janitor/maintenance person uses special types of equipment to perform the work. As a janitor/maintenance person, you use--

- simple tools such as brooms for sweeping floors
- complicated equipment such as power tools for making minor repairs
- a floor machine to scrub, wax, or buff floors or shampoo rugs
- steam cleaners to remove heavy soil from floors and equipment
- vacuum cleaners to sweep carpets
- lawn mowers and trimmers to take care of lawns and bushes

IF YOU ARE INTERESTED IN

THE WORK OF A JANITOR/MAINTENANCE PERSON

AND WOULD LIKE TO KNOW MORE,

READ ON

WHAT TRAINING, EDUCATION, AND EXPERIENCE DO YOU NEED TO BECOME A JANITOR/MAINTENANCE PERSON?

What do you think? Would you like to be a janitor/maintenance person? If you would, there are some things you should know.

To get a job as a janitor/maintenance person, you need to know the basics about--

- carpentry
- electricity
- plumbing
- house repair

You also need to know how to--

- work alone or with others
- read instructions and follow directions

The best way to learn these things is to take shop courses at your high school or vocational education center.

There are no special educational requirements to be a janitor/maintenance person. However, you should be a high school graduate and you should be able to do simple arithmetic.

Taking every chance to learn new skills and tasks will help you do a better job. Good math skills will also help you perform your work as a janitor/maintenance person.

DO YOU WANT TO DO MORE JANITOR'S/ MAINTENANCE PERSON'S MATH?

Practice Exercise E

For questions 21-25, how many cups of water are needed?

	Directions	Cups of Cleaning Product Used	Cups of Water Needed
21.	2 parts cleaning solution to 3 parts water	4	?
22.	3 parts cleaning solution to 4 parts water	6	?
23.	1 part cleaning solution to 8 parts water	3	?
24.	1 part cleaning solution to 6 parts water	7	?
25.	1 part cleaning solution to 1 part water	10	?

Practice Exercise F

How many square feet will each bottle of wax cover?

	Ounces in Bottle	Square Feet 1 Ounce Covers	Total Number of Square Feet
26.	32	10	?
27.	18	16	?
28.	24	112.5	?
29.	48	95.5	?
30.	10	79.4	?

Practice Exercise G

Copy and complete the chart below.

	Amount Used in 1 Week	Number of Weeks Supply	Total Amount in Inventory
31.	83	6	?
32.	?	4	140
33.	25	?	200
34.	43	4	?
35.	65	?	325

Practice Exercise H

How many minutes can you spend cleaning each office?

	Number of Offices To Clean	Number of Hours	Number of Minutes in Each Office
36.	12	4	?
37.	18	3	?
38.	30	7-1/4	?
39.	30	6-1/2	?
40.	20	5-1/4	?

DO YOU WANT TO EXPLORE SOME MORE?

1. To be a good janitor/maintenance person, you must be able to read and follow instructions. Practice reading labels on cleaning products in the grocery store and your home. If you do not understand a word or measurement, ask for help from a family member. Or write down your question and ask a teacher later.

2. Go to a school, office building, or apartment building. Ask to watch a janitor/maintenance person do the job. Think about what you like and don't like about the tasks you see performed. Ask the janitor/maintenance person how she/he knows each day which tasks to perform. Ask the janitor/maintenance person what he/she likes and dislikes about the work.

3. Ask to sweep, wash, and wax a floor in your home. Follow the directions on the cleaning and wax products you use. If you have a question, ask someone for help.

4. Make a list of the things that must be cleaned for each room in your home.

5. Think about how you could clean an entire room as well and as quickly as possible. Think about how you could clean an entire home well and quickly.

6. Are you interested in other jobs which are similar to that of the janitor/maintenance person? Other persons who work to keep buildings clean, safe, and attractive include--

   - head custodians
   - building supervisors
   - maids
   - hotel, motel, and hospital housekeepers
   - pest controllers

   You must have good math skills to do these jobs well. Most of these workers add, subtract, multiply, and divide every day on the job.

GLOSSARY

Asterisk (*): a mark that tells you to look at the bottom of the page for the meaning, or definition, of the word.

Estimate: to carefully guess the number or amount of something.

Glossary: a list of words with their meaning.

Maintenance: the upkeep and care of property and equipment.

ANSWER SHEET

Practice Exercise A

1. 6
2. 24
3. 17
4. 30
5. 27

Practice Exercise B

6. 1,408 square feet
7. 1,792 square feet
8. 3,072 square feet
9. 2,654.4 square feet
10. 1,480.8 square feet

Practice Exercise C

11. 256
12. 90
13. 8
14. 450
15. 3

Practice Exercise D

16. 24 minutes
17. 7-1/2 minutes
18. 15 minutes
19. 14 minutes
20. 10-1/2 minutes

Practice Exercise E

21. 6
22. 8
23. 24
24. 42
25. 10

Practice Exercise F

26. 320
27. 288
28. 2,700
29. 4,584
30. 794

Practice Exercise G

31. 498
32. 35
33. 8
34. 172
35. 5

Practice Exercise H

36. 20 minutes
37. 10 minutes
38. 13-1/2 minutes
39. 13 minutes
40. 15-3/4 minutes